

Appendix C – Calculating Linked Dimensions

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1 CALCULATING LINKED DIMENSIONS IN TC-AIMS II

When the user links items in TC-AIMS II, such as hitching a trailer to a truck, putting a box on a pallet, the TC-AIMS II system is responsible for performing a series of mathematical calculations on the dimensions of the linked items, creating "linked" dimensional data for the joined entity. Having performed these calculations, the system will then retain, display, export, and further utilize the linked dimensional data, as needed, in order to support the transportation planning process. TC-AIMS II utilizes a series of rudimentary formulas and business rules to derive the dimensional data.

A linked item is commonly referred to as a "child" of the "parent" item. When item "A" (a box), is linked to (put onto) item "B" (a pallet); "A" is called the "child" of the "parent" item "B".

TC-AIMS II calculates the linked dimensional values when a link is created by the user in "Create Mobile/Secondary Loads" under the Movement Planning section of TC-AIMS II and in "Linker" under Movement Execution. If dimensions are changed for a linked item, the linked dimensions are recalculated for all related items.

1.1 CUBE AND AREA CALCULATIONS

The standard TC-AIMS II calculation for CUBE is:

Height in inches multiplied by width in inches multiplied by length in inches, converted to feet by being divided by 1728. The result is rounded up to a whole number, removing decimal values.

The standard TC-AIMS II calculation for AREA is:

Length in inches multiplied by width in inches, converted to feet by being divided by 144. The result is rounded up to a whole number, removing decimal values.

If a child (A) does not have subsequent links (C), then the child's listed dimensions are used for calculations of the presented linked dimensions.

1.2 OVERHANG CALCULATIONS

Overhang calculation for LOADED ONTO/MOBILE LOADED/PALLETIZED links where the child's linked length or width is greater than the parent:

Left overhang is half the child's width - host width rounded up to next integer. Bed width is used if available.

Right overhang is half item minus host width rounded up to next integer. Bed width is used if available.

Rear overhang is the linked length minus the host length. Bed length is used if available.



Both the left and right overhangs are calculated based on the width of the parent and the width of the child. If the child is wider than the parent, then the system will calculate the amount that the child will be extending beyond the parents width.

The system will assume that the child is centered over the smaller parent resulting in overhangs on the right and left that are equal. Both the right and left overhangs will be one half of the excessive width of the child. E.g. Childs width is 120 inches, Parents width 90 inches, amount of overhang would be 120 inches minus 90 inches = 60 inches divided by 2= 30 inches of overhang, left and right side. If the parent bed width is known, the bed width will be used as the parents width for this calculation.

Rear overhang is the child's linked length minus the host's (parent's) linked length.
Bed length is used if available

2 CALCULATING LINKED DIMENSIONS

2.1 HITCHED

Parent Linked Dimensions Calculation						Cube
To Parent	Length	Width	Height	Weight	Area	Cube
Hitched	Parent not impacted. The Childs linked length is the greater of the item length plus the tongue length or the child linked length.	Not impacted				

2.2 INVENTORIED

Parent Linked Dimensions Calculation						Cube
To Parent	Length	Width	Height	Weight	Area	Cube
Inventoried	Not impacted					

2.3 LOADED ONTO

Parent Linked Dimensions Calculation						Cube
To Parent	Length	Width	Height	Weight	Area	Cube
Loaded onto	Greater of 1) The parent length or 2) The child linked lengths Bed length used, if any.	Greater of the 1) The parent width or 2) The child linked widths	Item height (bed height, if any) plus the greatest single linked height of children having a link type of "Loaded onto"	Sum of the item weight plus all of it's children linked weight	Std calculation based on linked dimensions	Std calculation based on linked dimensions

2.4 MOBILE LOADED

Parent Linked Dimensions Calculation					
	Length	Width	Height	Weight	Area
To Parent					Cube
Mobile loaded	Greater of 1) The parent length or 2) The child linked lengths. Bed length used, if any.	Greater of the 1) The parent width or 2) The child linked widths.	Not impacted	Sum of parent weight plus child linked weights	Std calculation based on linked dimensions
					Std calculation based on linked dimensions

2.5 PALLETIZED

Parent Linked Dimensions Calculation					
	Length	Width	Height	Weight	Area
To Parent					Cube
Palletized	Not impacted	Not impacted	Not impacted	Sum of parent weight plus all child linked weights	Std calculation based on linked dimensions
					Std calculation based on linked dimensions

2.6 PUT INTO

Parent Linked Dimensions Calculation					
To Parent	Length	Width	Height	Weight	Area
Put into	Not impacted	Not impacted	Not impacted	Sum of parent weight plus all child linked weights	Not impacted
					Not impacted

2.7 SET

Parent Linked Dimensions Calculation					
To Parent	Length	Width	Height	Weight	Area
Set	Largest single linked length of the item and all its children having a linked type of SET	Largest single linked width among the item and all its children having a linked type of SET	Largest single height, or linked height if any, among item and it's children having a link type of SET	Sum of the item weight plus the child linked weights	Std calculation based on linked dimensions

2.8 STACKED

Parent Linked Dimensions Calculation					
To Parent	Length	Width	Height	Weight	Area
Stacked	Greater of parent length or child's linked length	Greater of parent width or child's linked width	Sum of parent height plus child's linked height	Sum of parent weight plus child's linked weight	Std calculation based on linked dimensions
					Std calculation based on linked dimensions

2.9 RECALCULATING OVERALL DIMENSIONS FOR HITCHED ITEMS

Parent Overall Dimensions					
Link Type	Parent Overall Dimensions	Width	Height	Weight	Area
Recalculati on	Length	Width	Height	Weight	Area
Hitched	Sum of the parent plus child linked lengths	Greater of the parent or child linked widths	Greater of the child plus parent linked heights	Sum of the child plus parent linked weights	Std calculation based on linked dimensions
					Std calculation based on linked dimensions